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18 AUG 1964

MEMORANDUM FOR: Special Assistant to the President for
National Security Affairs

SUBJECT: Scientific and Technical Efforts in the
Foreign Intelligence Field

REFERENCE: Your Memorandum to DCI dated 8 July 1964,
same subject

1. This is in reply to that portion of your memorandum of 8 July in which you requested an updating of information on the progress of the Agency in S&T fields. The Department of Defense is not yet prepared to respond to paragraph 13a and 13c of the PFIAB recommendations of 8 March 1963. I will send their response along when it is received. Since the problems of CIA and of Defense in this field are totally different, it does not seem practicable to prepare a coordinated answer.

2. With respect to the second part of your request, this CIA report outlines the Agency's position, which I discussed at some length with the President's Board on 7 August. A Scientific Advisory Board to the DCI has been in operation for some months and has been very helpful in advising the Director on the adequacy of Agency research and development and in pointing out possible application of newly emerging scientific developments.

3. [REDACTED] area channels similar ideas into the Agency. In addition, a number of special panels have contributed to CIA's basic mission. Among these are the [REDACTED] (Soviet nuclear program), [REDACTED] (Soviet missile and space programs), [REDACTED] (ChiCom nuclear program), and the [REDACTED] (Soviet ICBMs). These groups have been of great assistance in reviewing inputs to NIEs and in helping to solve problems of collection and assessment.

4. The Agency has approximately [REDACTED] highly qualified scientific and technical consultants, some on call and others on regular contract. These arrangements are paralleled by increasing efforts to attract competent

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scientists and engineers to the CIA career service. The aim is to make it possible for the Agency to examine the research and development activities of government and industrial laboratories, and to relate the results of basic research and work in advanced concepts to analytical and collection problems of intelligence.

5. My memoranda submitted in December 1963 and June 1964 gave considerable detail on the structure, staffing, consultants, and advisory boards formed to carry out the Board recommendation that "top priority be given to the creation, organization, and exploitation of new resources in science and technology for use in intelligence activities...." At this time it seems appropriate that I discuss substantive activities. In so doing, I refer to Figure 1 which displays the units of organization of the new Directorate for Science and Technology against a background of the classic functional elements of the intelligence process.

6. Systems Analysis Staff - This new staff has two major accomplishments to its credit during the past six months. Working closely with consultants, advisors, and contract groups, including the Optics Panel of Dr. [REDACTED]'s Scientific Advisory Board, the SAS developed the system design for an overhead reconnaissance satellite which has been reviewed and favorably commented upon by leading optical physicists and photo experts in the United States. Funding and management assets are being sought to prove out the design as an operational system.

Some of the same type of progress has been made in the investigation of a new satellite collection system for ELINT intercept from difficult, denied-area targets. This project is in an early stage of development, although it has been funded for preliminary system design and detailed feasibility analysis. The major problems are to determine the RF signal environment and select the best methods and equipments for excluding unwanted signals.

Both of the above projects embody new concepts and will couple the most advanced technologies in several scientific and engineering fields to intelligence collection operations.

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We are directing research on self-contained "stay-behind" chemical and biological monitoring/analysis systems similar to those being developed by NASA for the detection of life on Mars or Venus.

We are sponsoring preliminary studies in pattern recognition, artificial intelligence, and communications to develop devices and techniques which will augment the capacity of humans to analyze photographs, ELINT and audio tapes, or other data/signals.

8. Office of ELINT - The OEL is steadily increasing its aptitude for advanced work on electronic signal collection, identification, and analysis. They are pioneering many technically advanced systems and complex techniques which are in the forefront of both offensive and defensive electronics warfare. The intelligence which OEL now seeks is not provided by any other activity; yet, it is knowledge which finds direct applications by those engaged in the design and development of electronic countermeasures equipment, including jammers for aircraft.

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calibration ranges. OEL has also developed a high capability for the collection of information-bearing signals such as telemetry and beaconry from missiles and space vehicles and for data links associated with the instrumentation and tracking on the Soviet ranges. Sophisticated, unmanned equipment

9. Office of Special Activities - The OSA is the principal operational unit of the DD/S&T and works continually to expand its capabilities for over-head reconnaissance of all types. Aside from increasing its utilization of the sub-sonic U-2 system, it is participating in the development of supersonic aircraft and space vehicles as collection platforms. Most of the work done by OSA falls under Program B of the National Reconnaissance Program. PFIAB is briefed and has been furnished periodic reports on the activities of this Office.

10. Office of Scientific Intelligence - The OSI is the scientific and technical intelligence-producing element of DD/S&T and continues to provide across-the-board reports and briefings on Sino-Soviet Bloc capabilities in science and technology. Their reports range from individual technical reports to contributions for major national intelligence estimates (Soviet Atomic Energy Program, Soviet Capabilities for Strategic Attack, etc.) produced by the Office of National Estimates. We are increasing both the quantity and quality of OSI reports through utilization of contractors, internal and external training programs, and the re-orientation of activities so as to target our activities against more complex systems and problems.

11. Foreign Missile and Space Analysis Center - FMSAC continues to build toward its objective as the central government source for reporting on foreign missile range and space activities throughout the world. Its present strength is [REDACTED] during this Fiscal Year. Many of FMSAC's operations are being designed into computer format in order to provide automated storage and retrieval of data. In addition, this group is staffing with personnel technically qualified to take advantage of the many and diverse opportunities afforded by the scientific computation capacity of the Office of Computer Services.

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The control room of FMSAC is now in operation 24 hours a day, receiving all source information and publishing daily summaries of missile and space activities and more comprehensive reports which "wrap up" all known data on each important event.

12. Office of Computer Services - The OCS is broadening its capability in order to provide the Agency with a scientific computation capability. This support is needed to provide FMSAC, OEL, and OSI with means for trajectory analysis of Soviet firings, programs for ELINT and RADINT analysis, and for simulation and systems evaluation work. Within the past month, Computer Services has been called upon by OEL alone to: (a) generate a complex display/plot of an airborne ELINT mission; (b) simulate "play" between Soviet radar signals and the intercept problem (environment, operational factors, vehicle vulnerability) to determine the degree of success which we might expect from ELINT collection systems; (c) develop programs for the processing of ELINT data from enemy phased array radar systems; and (d) complete a program for the storage and retrieval of some specialized ELINT data to be stored on cards.

13. While there is still much to be done in channeling science and technology into the CIA and developing it toward intelligence needs, I feel that FY 64 has been a year of progress. In particular, the Agency has been organized and postured to attract well-qualified scientists and engineers into the organization and to seek out from among the Government and industrial research laboratories the results of basic research and advanced concepts which we can relate to the Agency mission.

(Signed) JOHN A. McCONE

John A. McCone
Director

cc: President's Foreign Intelligence
Advisory Board

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Functional Description of DD/S&T

REQUIREMENTS

**RESEARCH &
PRELIM. DESIGN**

DEVELOPMENT

OPERATIONS

DATA REDUCTION

ANALYSIS

ESTIMATES

SYSTEMS ANALYSIS STAFF

RESEARCH & DEVELOPMENT

SPECIAL ACTIVITIES

ELINT

COMPUTER SERVICES

ONE

FOREIGN MIS. & SPACE ANAL. CTR.

FIGURE I

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